

Working Group 1

Damage Prevention

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Attendance Breakdown

Approximate total attendance	23 persons
Federal Regulators	1 persons
State Regulators	0 persons
International Regulators	0 persons
Pipeline Industry/Service Providers	9 persons
Standard Developing Organizations	0 persons
Researchers	4 persons
Academics	9 persons
Other	0 persons

Top 5 Identified R&D Gaps

Gap #1 – Need for system-defense of new and existing pipelines

Gap #2 – Intrinsically locatable plastic materials (New and replacement)*

Gap #3 – HDD and other excavation tools with look-ahead technology to detect and avoid subterranean conflicts

GAP#4 – Analysis of damage (Ex: DIRT/CGA database) big data (semantics, analytics and filtering) to develop a detailed risk model (Excavators, areas or equipment)

GAP #5 – GPS-based damage defense system installed on excavating tools to detect ROW encroachment

NOTE: Identify gaps with* that may be addressed with University Partnerships

Associated Details

(Gap #1)

Gap: Need for system-defense of new and existing pipelines through:

- Airborne patrol
- Tower monitoring
- Satellite surveillance (24/7)
- Drone technology
- Vehicle patrol
- ??

• Requirements

- *Evaluation of current Cost of patrolling and monitoring*
- *Repeatability*
- *False-positives in diverse environments*
- *Weather and soil impacts*
- *Notice before damage occurs*
- *Maintenance free*
- *Vandalism*

1. New or Improved Technology

- a. What pipeline type(s) does the technology target? All
- b. What operating environment(s) would the technology operate? Onshore
- c. What are any functionality and or performance requirements? See Above
- d. What road blocks or barriers prevent the technology deployment? Cost, Federal regulations, technology availability
- e. What are anticipated targets or timeframes to complete this research? 3-5 years

Associated Details

(Gap #2)

Intrinsically locatable plastic materials (New and replacement)

- **Cost effective**
- **Reliable**
- **3D**
- **Commodity neutral**
- **Identify unlocatable pipelines (Legacy/future)**

1. New or Improved Technology

- a. What pipeline type(s) does the technology target? Gas and liquid Distribution pipelines
- b. What operating environment(s) would the technology operate? Onshore
- c. What are any functionality and or performance requirements? See above
- d. What road blocks or barriers prevent the technology deployment? Technology, approval process
- e. What are anticipated targets or timeframes to complete this research? 3-5 years

Associated Details

(Gap #3)

HDD and other excavation tools look-ahead technology to detect and avoid subterranean conflicts

1. New or Improved Technology (Nonproprietary)

- a. What pipeline type(s) does the technology target? All
- b. What operating environment(s) would the technology operate? All
- c. What are any functionality and or performance requirements? Detection within 18", detect all underground assets, minimal training requirements, no false-positives, new or improved
- d. What road blocks or barriers prevent the technology deployment? Cost, variability of soil conditions
- e. What are anticipated targets or timeframes to complete this research? 3-5 years

Associated Details

(Gap #4)

Analysis of damage (Ex: DIRT/CGA database) big data (semantics, analytics and filtering) to develop a detailed risk model (Excavators, areas or equipment)

1. New or Improved Technology with Creation and Dissemination of General Knowledge

- a. What pipeline type(s) does the technology target? All
- b. What operating environment(s) would the technology operate? All
- c. What are any functionality and or performance requirements? Make use of semantic web technology, ability to merge with existing databases, optimize deployment of damage prevention solutions
- d. What road blocks or barriers prevent the technology deployment? Data fragmentation and quality, Regulatory (State/Federal) approval of data sources
- e. What are anticipated targets or timeframes to complete this research? 3-5 years

Associated Details

(Gap #5)

GPS-based damage defense system installed on excavating tools to detect ROW encroachment

- **Filtering out alerts**
- **Incentive for adoption**
- **Integration with one-call centers**

1. New or Improved Technology

- a. What pipeline type(s) does the technology target? All
- b. What operating environment(s) would the technology operate? Onshore
- c. What are any functionality and or performance requirements? See Above
- d. What road blocks or barriers prevent the technology deployment? Cost, GPS quality, incentives for adoption
- e. What are anticipated targets or timeframes to complete this research? 1-2 years

Future University Work

Communication between Industry and Academics

Identify plastic pipe inserted in steel pipe (conduit)

Intrinsically locatable plastic material

Additional Identified Gaps

Gap: Excavator awareness of differences in regulations between states

Gap: Technology to locate all underground assets including ceramic and plastic

Gap: Use of GPS on locate equipment to better map pipelines in GIS

- Lower cost of accurate GPS
- Streamline into GIS

Gap: Integrate accurate ILI data into GIS mapping

Gap: Tools using distributive telecommunication infrastructure (AMR) for damage prevention information collection